DRAFT

Cal/EPA Environmental Justice Action Plan

DPR Parlier Pilot Project Update

May 31, 2007

I. Lead Cal/EPA Board, Department or Office (BDO): Department of Pesticide Regulation (DPR)

II. Project Area: The community of Parlier, Fresno County.

Parlier is a small city (about 1.6 square miles in area) located in the San Joaquin Valley, approximately 20 miles southeast of Fresno. In the 2000 United States (US) Census, the City of Parlier's population was 11,088. Approximately 38 percent of the population is less than 18 years old. Most of the population (97 percent) is Hispanic. The median annual family income in Parlier is $24,275.

III. Background: Parlier is a rural community surrounded by agriculture. The City's major crops are grapes and tree fruits. The most heavily used pesticides in the area are insecticides and fungicides.

For a detailed briefing paper on the selection factors and relative weightings of the 83 communities DPR evaluated, please refer to DPR's Environmental Justice Website www.cdpr.ca.gov/docs/envjust/pilot_proj/index.htm.

The Parlier Project includes DPR's monitoring of ambient air concentrations of 26 pesticides and five breakdown products the Air Resources Board's (ARB) monitoring of ambient air concentrations of nine other pesticides. The data gathered is anticipated to assist DPR in evaluating the ambient air exposure to pesticides (more details on the pilot project at www.cdpr.ca.gov/docs/envjust//pilot_proj/index.htm.).

IV. Project Start Date: Spring 2005

Project Goals and Objectives: The overarching goal of the Project is to evaluate ambient air exposure to pesticides in order to better understand and identify opportunities to reduce environmental health risk, particularly to children. The project will also explore the precautionary approach in the context of reduced-risk approaches to pest management. The project seeks to answer the following questions:

1. Are residents of the community exposed to pesticides in the air?
2. Which pesticides are people exposed to in the air and in what amounts?
3. Do measured pesticide air levels exceed levels of concern to human health, particularly children's health?

In this context, the objectives of the project are the following:

1. Inform the community about the project.
2. Evaluate pesticide risk compared with other pollutants that are monitored.
3. Reduce pesticide risk.
4. Follow up on the findings, for example, by possibly providing education and technical support to farmers to encourage them to use alternatives that are less toxic or, if there are health concerns, DPR could put stricter controls on certain problematic uses.

V. Project Status:

a. Public Participation

The local advisory group (LAG) was the key to ensuring meaningful public participation in this environmental justice project. DPR has been committed to ensuring that the LAG is representative of both the Parlier community and environmental justice interests. In May 2005, DPR formed the LAG to advise the DPR on the pilot project. The LAG includes representatives of the California Rural Legal Assistance Foundation, Californians for Pesticide Reform, Fresno County Agricultural Commissioner's office, Fresno Metro Ministry; Latino Issues Forum, LUPE (La Unión del Pueblo Entero), Parlier City government, Parlier HEAL Asthma Project, United Health Center in Parlier and the Parlier Unified School District. The LAG also includes a local realtor; a Parlier vintner; and three farmers, including an organic farmer.

DPR actively sought public input on the protocol for the Parlier project, unlike previous air monitoring projects undertaken. The draft protocol was posted online for public comment and discussed extensively at public meetings of the LAG. This process began on June 9, 2005 and continued for three months. DPR received numerous comments on the protocol from the public via the Web, by postal mail, and at LAG meetings. The LAG and the Project's Technical Advisory Group (TAG) members also provided many comments.

DPR revised the protocol in response to comments. In September 2005, DPR, the LAG and the TAG approved the protocol through this collaborative process. The guidance from the LAG was instrumental in the selection of location of the sampling, the pesticides selected, and frequency of sampling.

One of the LAG recommendations was that DPR hold community forums to inform the community about the project and at the conclusion, to share results. On January 28, 2006, DPR sponsored a public forum at the Parlier Community Center. To encourage greater attendance, DPR invited staff from more than 20 other governmental programs to discuss their services to improve health, safety, jobs, and education in the Parlier community. The Fresno County Health Department provided immunizations and a mobile dental clinic. Approximately 300 people attended the community forum. In addition to the public forum, DPR staff made presentations to children at two of the schools where monitoring equipment was located.

The LAG met several times in 2006 to discuss data analysis methods and screening levels developed by DPR toxicologists. At the meetings DPR also gave the LAG periodic updates on the sampling and the concentrations measured. DPR presented the results from it's monitoring for the entire year to the LAG in March 2007. There was extensive discussion of the results; how they correlated to the screening levels, and what DPR's next steps would be.

At the March 2007, LAG meeting, a coalition of water and community groups requested that DPR do more comprehensive monitoring of ground water in the Parlier area, including domestic wells. However, this issue of expanded ground water quality monitoring was made after the 2005 public comment period. Hence, DPR will consider this issue in the development of future monitoring projects.

The next LAG meeting will be in October or November 2007, to discuss findings from DPR's pest management assessment.

b. Participation by Other Departments and Agencies

In 2005, a Technical Advisory Group (TAG) was formed to provide DPR with an outside review of air monitoring, modeling, toxicology, pest management, and other technical and scientific elements of the project. The TAG is made up of staff from ARB, Office of Environmental Health Hazard Assessment (OEHHA), California Integrated Waste Management Board (CIWMB), California Department of Health Services (DHS), California Department of Food and Agriculture (CDFA), Fresno County Agricultural Commissioner's office, San Joaquin Valley Air Pollution Control District, University of California at San Francisco (UC SF)– Valley Air Pollution and Health Effects Research Institute, University of California at Davis (UC Davis) – Western Center for Agricultural Health and Safety, California Tree Fruit Agreement, and the California Minor Crops Council.

c. Screening Levels

Enforceable state or federal health standards have not been established for most pesticides in the air. For this pilot project, DPR with assistance from OEHHA developed health screening levels for each pesticide to help determine when it may be prudent to evaluate potential health effects of chemical exposure. The methods used to determine the screening levels and the values of the levels were reviewed by the TAG. By itself, a screening level does not indicate the presence or absence of a hazard, but detections above a screening level point to a need for further evaluation.

DPR developed different screening levels for each pesticide monitored, according to length of exposure (details at www.cdpr.ca.gov/docs/envjust/pilot_proj/index.htm). This is the typical procedure for all potential toxins -- health effects may differ when a subject is exposed for a single day compared with being exposed for a year or longer. Short-term or "acute" exposure is considered about a day or two. "Sub-chronic" exposure is considered several weeks, or a season of pesticide use. Long-term or "chronic" exposure is considered a year or more, typically for a significant portion of a lifetime.

Monitored air concentrations of pesticides below the screening level would suggest a low health risk but would not automatically be considered "safe". At the same time, concentrations above the screening level did not necessarily mean health problems would occur. Screening levels were used as tools during the project to help DPR decide which detections needed immediate evaluation.

d. Pesticides Monitored

DPR analyzed for the following pesticides:
azinphos-methyl, chlorothalonil, chlorpyrifos, cypermethrin, diazinon, dichlorvos (DDVP), dicofol, dimethoate, diuron, endosulfan, EPTC, malathion, methyl isothiocyanate, metolachlor, molinate, norflurazon, oryzalin, oxyfluorfen, permethrin, phosmet, propanil, propargite, SSS-tributyltriphosphorotrithioate (DEF), simazine, thiobencarb, trifluralin and the breakdown products of chlorpyrifos, diazinon, dimethoate, endosulfan, and malathion

With ARB's assistance, DPR also monitored for the fumigants 1,3-dichloropropene and methyl bromide, acrolein, arsenic, carbon disulfide, formaldehyde, xylene and the metals/elements copper and sulfur.

For a detailed briefing paper on the selection factors and candidate pesticides, please see DPR's Environmental Justice Web site www.cdpr.ca.gov/docs/envjust/pilot_proj/index.htm.

e. Data Collection

DPR monitored for twenty-six of the pesticides (plus 5 breakdown products) at three sites in Parlier, by collecting 24-hour samples, three consecutive days a week, for 52 weeks. Sampling began on January 3, 2006, and ended on December 28, 2006.

DPR monitored at three elementary schools in Parlier: Martinez (northwest part of town), Benavidez (central), and Chavez (southeast).

ARB monitored for 26 volatile organic compounds (VOCs) and 28 metals/elements at Benavidez Elementary School during a 24-hour period every six days. The sampling frequency increased to a 24-hour period every three days during peak use season for sulfur and 1, 3-dichloropropene. In addition, ARB monitored particulate matter (particulate matter 2.5 or $PM_{2.5}$) on a continuous basis at the same location.

The San Joaquin Valley Air Pollution Control District has a monitoring station at the University of California Kearney Agricultural Center, about a mile southeast of Parlier. The monitoring station provides continuous data on nitrogen dioxide and ozone.

f. Sampling Results

During 2006, DPR released two progress reports presenting the data for the Parlier monitoring. The second progress report and the March 2007, addendum contained all of the results for the entire year of DPR's sampling and ARB's results through June 28, 2006.

In twelve months of monitoring, DPR collected 468 samples that were analyzed for multiple pesticides and another 468 that were analyzed for the fumigant pesticide methyl isothiocynate (MITC).

The key results of the monitoring:

- Twenty-three pesticides or breakdown products were detected.

- Of the 23, 17 are pesticides are assumed to be present because of their use as pesticides. One pesticide (diclorvos, used both in agricultural and home-and-garden settings), however, had no reported use in the Parlier area during the study period.

- The remaining five compounds detected have some pesticidal uses, but their presence is typically due to non-pesticidal sources (for example, vehicle emissions). Four of the five compounds had no reported pesticidal use. The fifth compound, xylene, had reported use as a pesticide but most of the detections are believed to be non-pesticidal in origin.

- Two pesticides exceeded the acute health screening levels. Diazinon exceeded the acute screening level during one day of the 156 days monitored. The highest concentration detected for the pesticide diazinon and the diazinon oxygen analog (OA) together at a single site was 243 nanograms per cubic meter (ng/m^3). The acute screening level for diazinon and diazinon OA is 130 ng/m^3 for each chemical. In addition, acrolein exceeded the acute health screening levels for most of the days monitored. Acrolein concentrations measured were similar to those typically found in other areas of the state. The acrolein detections were likely due to non-pesticidal sources (for example, vehicle emissions).

- Diazinon was the only pesticide monitored that exceeded its screening level for an acute (one-day) period due to pesticidal use. No pesticides were detected over chronic or subchronic screening levels. Chlorpyrifos or its breakdown product was also detected in many samples. No sample was above the screening level. However, if the federal Food Quality Protection Act (FQPA) safety factor had been applied to the acute screening level for chlorpyrifos, it would have lowered it by a factor of 10. If that were done, six of the 468 samples would have been above the screening level. A number of pesticides were detected multiple days at multiple sites.

- The pesticide with the highest concentration was formaldehyde, detected at 9,250 ng/m^3 [7.7 parts per billion, ppb] (below the acute screening level of 19,000 ng/m^3 [15.8 ppb]). The formaldehyde detections were likely due to non-pesticidal sources.

- The chemical with the highest concentration that likely resulted from pesticide use was the fumigant MITC, detected at 5,010 ng/m^3 [1.7 ppb] (acute screening level is 66,000 ng/m^3 [22 ppb]). MITC was also the pesticide most frequently (84 percent of 468 samples) detected by DPR. All concentrations were well below the screening level.

- As many as 11 pesticides were detected at an individual location and day (four additional pesticides were likely due to non-pesticidal sources).

- Three of the five Parlier municipal wells that supply the drinking water for the city were monitored for seven pesticides and four breakdown products that have been found in ground water in other area. The samples contained no detectable concentrations of the chemicals.

g. Data Evaluation

DPR is using a variety of approaches to assess the cumulative impact of pesticides and other pollutants, and applying the precautionary approach. DPR is evaluating the pesticide monitoring data using standard risk assessment methods. DPR is also evaluating the data for potential health risks from exposure to individual pesticides as well as to multiple pesticides (cumulative risk), exploring various approaches.

Since diazinon was found at concentrations above screening levels, DPR is conducting a more detailed evaluation of the data. DPR is using statistical techniques and computer modeling to attempt to correlate detected concentrations with pesticide use patterns and weather conditions. If successful, this analysis will assist DPR in identifying the source(s) or circumstances of the pesticide detections. The data helps DPR to evaluate the geographic scope, timing and use factors that contributed to the air concentrations. These and other data can establish parameters of problematic residues. The data are necessary to develop effective measures to minimize or eliminate unacceptable air exposures, and are required by law to support regulatory action. Although chlorpyrifos was not detected at a level above the screening level, a similar approach is being used to evaluate its detections.

As a result of the measured air levels of diazinon, DPR has added diazinon to its list of the active ingredients with a high priority for risk assessment. In addition, chlorpyrifos, which is already undergoing risk assessment, was placed on a more accelerated track.

The monitoring results are being evaluated to determine the exposure and risk from individual as well as multiple pesticides. The data will be compared to historical monitoring results from other areas. DPR is also evaluating the results and pesticide use patterns at the time of monitoring to determine possible mitigation measures, as well as other potential areas and time periods for future monitoring. The study has also allowed DPR to develop sampling and laboratory methods that can be used in other areas with minimal additional work.

With assistance from the ARB, DPR is also comparing air concentrations of criteria

pollutants, volatile organic compounds, and metals in Parlier with other areas of the state. In addition, DPR is collaborating with OEHHA and DHS in analyzing the data and determining if there are any correlations between pesticides or other environmental contaminants and disease incidence.

h. Precautionary Approaches

This project presents a number of opportunities for exploring precautionary approaches and supporting growers in the process. DPR is studying pest management practices in the Parlier area to help develop, evaluate, and promote lower-risk alternatives for Parlier's major crops--grapes, stone fruit, and citrus. In fall 2007, DPR expects to release a detailed analysis of how progressively the Parlier-area growers are dealing with pest problems and propose ways to share the innovative approaches they are taking with other farmers for their use. Some Parlier stone fruit growers have pioneered pest management methods that reduce use of organophosphates and other high-risk pesticides and have hosted many outreach meetings for pest control advisers and other growers. The personal contacts DPR staff made for the pest management assessment, with the information DPR gathered, became the foundation for providing even more technical and financial support to conservation-minded growers. To ensure farmers are aware of and familiar with the use of these alternatives, DPR will pursue research and outreach efforts through its state IPM coordinating role, new partnership initiatives, and grant funding.

Other ways the DPR has incorporated precautionary approaches into its process:

- DPR is funding two years of integrated pest management (IPM) research at the University of California Kearney Agricultural Center in Parlier, aimed at finding alternatives to organophosphate pesticides for managing vine mealybug, a damaging invasive pest of grapes.

- Fresno County fruit growers and their pest control advisers are working with DPR, the California Tree Fruit Agreement, US EPA, and the University of California Kearney Agricultural Center to test new reduced-risk methods and technology in the age old war against crop destroying pests. Funding was used to purchase a target-sensing "smart sprayer" that growers can use without cost.

- Partnership with the US Department of Agriculture Natural Resources Conservation Service paved the way for federal subsidies for growers using approved conservation practices in the San Joaquin Valley, starting with the 2007 growing season.

- In 2004 DPR put new laws into effect to protect the groundwater from pesticide contamination in areas the computer modeling identified as vulnerable to pesticide leaching.

It should be noted that in addition to the measures outlined above, which are taken after a pesticide is in use in California, additional precautionary steps are taken before a pesticide can be sold or used in California. Before obtaining registration for a pesticide product,

manufacturers must generate and submit health and environmental data to DPR for evaluation. The decisions that DPR makes about which pesticides to allow into the marketplace and under what conditions are based on cautious assumptions designed to protect human health and the environment from unacceptable impacts. When a product is registered, legally binding limitations are placed through product labeling on where, when and how the product can be used. The nature of this pre-registration evaluation is the basis for state laws that require DPR to have substantial data to cancel or modify the use of a pesticide.

i. Children's Health Environmental Risk Reduction Plan (ChERRP)

As noted previously, DPR's Pest Management Analysis and Planning Program is currently conducting a study in the project area of cropping patterns, pest pressures, pest control practices, pesticide use, application methods, and alternative pest management techniques, with a focus on integrated pest management. DPR is coordinating ongoing work already being done in the Parlier area such as, the Almond Pest Management Alliance and Outreach Project, DPR's federally funded project to develop organophosphate alternatives for stone fruit; and the Code of Sustainable Winegrowing Practices developed by the California Association of Winegrape Growers and the Wine Institute.

In addition, the world-renowned University of California Kearney Agricultural Center, located just outside Parlier, is conducting research and extension programs to help growers use farming practices that are economically, environmentally and socially sustainable.

VI. Upcoming Milestones and Activities:

Milestones

- The pest management assessment is planned for release in September 2007.
- The next LAG meeting will be held in October or November 2007.
- The final report for the pilot project is planned to be released in late 2007.

Activities

- Development of ChEERP
- Development of a plan for addressing accumulative exposure risk
- Final public workshop to present the entire report to the community.

VII. Project End Date:

Data collection ended December 28, 2006. Three interim reports on air monitoring were released over the course of the project, and the final evaluative report will be released late 2007 or early 2008.